



Ranunculus lingua

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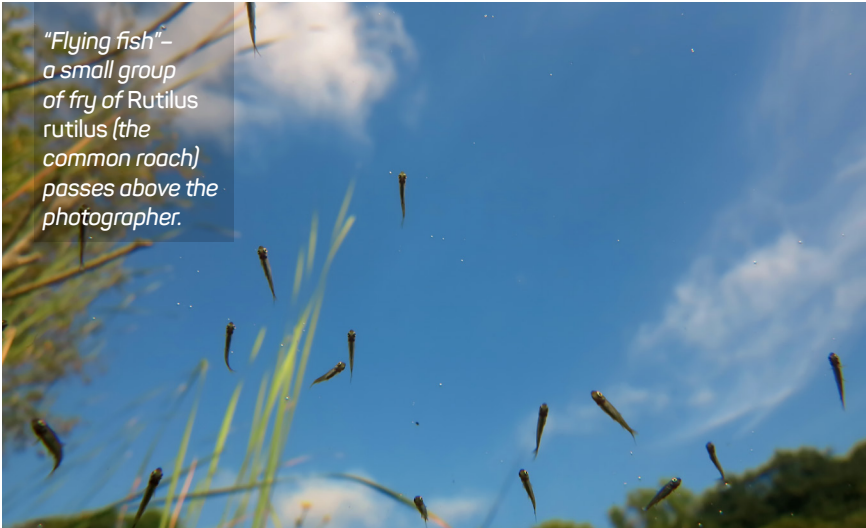
Published in:
The Aquatic Gardener

Publication date:
2018

Document version
Publisher's PDF, also known as Version of record

Document license:
[Unspecified](#)

Citation for published version (APA):
Pedersen, O. (2018). Ranunculus lingua. *The Aquatic Gardener*, 31(1), 25-28.



*"Flying fish"—
a small group
of fry of *Rutilus
rutilus* (the
common roach)
passes above the
photographer.*

RANUNCULUS LINGUA

by Ole Pedersen, Denmark

Photos by the Author

Vast areas of North America and Northern Europe were covered by ice during the last ice age and most present day lakes and streams were formed as the icecap melted some 10-15,000 years ago. New lakes and streams are constantly formed by natural processes, but also by human activities. Constructed wetlands are emerging worldwide to tackle climate changes where they serve to reduce flooding during torrential rains, and such ephemeral wetlands often support a diverse amphibious vegetation. However, open (and abandoned) mining areas can also support large numbers of young ponds and since these are often permanently waterfilled

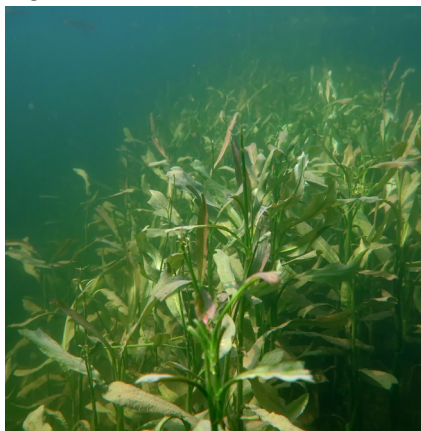
they also support a rich truly aquatic vegetation. The present article portrays the amphibious *Ranunculus lingua* from a gravel pit that was abandoned in 1974 when the construction of the nearby freeway was completed.

The small lake is relatively nutrient poor as it receives water from a sandy catchment that is mostly covered by deciduous forest. There are no aboveground inlets (or outlets) and thus the water derives from precipitation and diffuse seepage of groundwater; the water leaves the lake in the same way by evaporation or by seeping back into the groundwater. For most of the year, the water is relatively clear with very high CO₂ concentrations

as groundwater is rich in CO₂; we have previously measured up to 800 µmol/L (18 mg/L) in the bottom water where *R. lingua* is growing. The transparent water, the high CO₂ and also the moderately high alkalinity (high HCO₃⁻) deriving from the carbonate-rich soils in the catchment is a perfect cocktail for lush growth of submerged plants.

Ranunculus lingua is an amphibious plant that can form dense populations ranging from purely terrestrial (but with roots growing waterlogged) to completely submerged where the shoots never reach the surface. The aquatic leaves may at first glance look quite similar to the aerial leaves (homophyllous) but a closer study reveals that the lamina of the aquatic leaves is thin and with a greatly reduced cuticle (the leaves desiccate [dry out] immediately

- ▼ A population of *Ranunculus lingua* growing from 4m depth and up to the shores of an abandoned gravel pit.



when exposed to air). In shallow water with high light levels, the aquatic leaves can turn reddish but it only happens late in the growth season. So the red color is likely a combination of high light and nutrient limitation as late in the season most nutrients are bound in organic particles (mostly other plants, algae and dead organic matter). Interestingly, the aquatic leaves continue to grow throughout the winter since they are protected against frost damage in the water; the seeping groundwater is 8-9°C year round and thus the lake rarely freezes. *R. lingua* must be considered an European species (see distribution map) although it is found here and there all the way to the Middle East, the Caucasus, Siberia and Kazakhstan. It occurs more or less throughout Europe, although according to the IUCN red-list, it is classified as endangered in e.g., Spain, Switzerland, Serbia, Croatia and Norway, where it is also at the brink of its distribution.

Ranunculus lingua flowers above water; at least I have never seen submerged flowering, which is otherwise commonly observed for e.g., *Lobelia dortmanna* and *Utricularia australis*. The flower is bright yellow and up to 4.5 cm (almost 2") in diameter and each petal carries a big nectarium at its base. Self-pollination occurs but cross-pollination is more common as the flowers are frequently visited by bees, flies and beetles. *R. lingua* can also reproduce vegetatively



- ▲ In the deepest waters, *Ranunculus lingua* shares the habitat with a couple of species of Characeans, here *Chara hispida*.

- ▼ In shallow water, *Ranunculus lingua* grows intermingled with reeds and here the shoot can emerge to produce the characteristic yellow flower.



- ▲ The aquatic leaves are thin and flexible, up to 30 cm long and 8 cm wide with beautiful nervation. In shallow water with high light, the leaves sometimes appear reddish.

- ▼ *Veronica catenata* shares the habitat with *Ranunculus lingua* (the tall plants in the background). *V. catenata* is also amphibious but in this lake the population is found only submerged. The leaves are thin and transparent and always bright red to purple.



via runners—in fact, the deepest populations have probably spread from more shallow populations by horizontal rhizomes. Moreover, small plantlets are often formed at the shoot base in late summer or fall and these break off the mother plant and drift away to establish new populations.

Ranunculus lingua is unlikely to become a new blockbuster in the aquarium hobby. It is a large and robust plant that is more suitable for garden ponds where it seems widely used. It is not clear how the widespread use in garden ponds affect the natural populations, and it is also not known if the plants that are sold at nurseries all derive from the same population or whether *R. lingua* has been “domesticated” at multiple times. Nevertheless, the plant has some interesting qualities making it worth a try in large tanks

- ▼ *The flower of Ranunculus lingua with 5 green sepals (not visible), 5 yellow petals, numerous stamens and numerous carpels. The flower is carried by shoots in shallow water emerging into the air.*



that are well illuminated. Especially the large transparent and reddish leaves are very attractive and not found among other temperate aquatic plants.

Ranunculus lingua shares its habitat with other submerged plants. In the shallow water, *Mentha aquatica* is thriving side-by-side with emergent stems of *R. lingua*, *Phragmites australis* and *Schoenoplectus lacustris*. Deeper in the littoral zone, species of *Characeans* are appearing and also the conspicuous *Veronica catenata* with its red leaves (see photo); these grow intermingled with *R. lingua*. The deepest zones are occupied by *Utricularia australis*, *Stuckenia pectinata* (formerly *Potamogeton pectinatus*) and some sections are also covered by dense mats of *Fontinalis antipyretica*.

This is a decent number of species considering that the lake is approximately 50 m wide and 300 m long (1.6 hectare). Bear in mind that the number of species expected in a given lake is closely related to its size, a phenomenon known as the species-area relationship.

In conclusion, it is highly recommended to visit your local wetlands—you never know what you may find. Most of the time, it is just a great recreational experience but it may also present an opportunity to try a local plant in your planted tank. Even temperate aquatic plants can perform surprisingly well as long as the temperature does not exceed 23–25 °C for an extended time. 🌿